WHAT IS CLAIMED IS:

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1. An autoprotected optical communication system, comprising:

a first optical carrier configured to transport optical signals in a first direction;

a second optical carrier configured to transport optical signals in a second direction that is opposite to the first direction; and

a plurality of nodes connected along the first optical carrier and the second optical carrier to form bidirectional links, the plurality of nodes communicating in pairs, one of the pairs defining a working link associated with a portion of the first optical carrier and a portion of the second optical carrier and being configured to exchange optical signals using a first wavelength on the first optical carrier and a second wavelength that is different from the first wavelength on the second optical carrier during a normal condition, the one pair of nodes being configured to exchange optical signals using the first wavelength on the second optical carrier and the second wavelength on the first optical carrier during a failure condition.

2. The system of claim 1, wherein each of the plurality of nodes selectively uses a predetermined subset of wavelengths within a set of transmission wavelengths, each of the plurality of nodes comprising:

a plurality of optical add/drop multiplexers serially connected to the first optical carrier and the second optical carrier, respectively, each of the optical add/drop multiplexers configured to selectively perform at least one of adding the subset of wavelengths to the first optical carrier and to the second optical carrier, dropping the subset of wavelengths from the first optical carrier and the second optical carrier, and bypassing remaining wavelengths of the set of transmission wavelengths.

3. The system of claim 1, wherein each of the plurality of nodes comprises:

an optical transmitter;

an optical receiver; and

a reconfigurable optical switch unit selectively coupling the optical transmitter and the receiver to the first optical carrier and the second optical carrier.

4. The system of claim 3, wherein each of the plurality of nodes comprises:

a plurality of information insertion devices optically coupled to the optical transmitter and configured to insert signalling information into the optical signals; and

a plurality of information extraction devices optically coupled to the optical receiver and configured to extract signalling information from the optical signals.

5. The system of claim 4, wherein the plurality of information insertion devices and the plurality of information extraction devices include optical transponders, optically coupling the optical switch unit to the first optical carrier and the second optical carrier, the optical transponders, being configured to change wavelengths of the optical signals.

6. A method of providing autoprotection in an optical ring network that includes a first optical carrier, and a second optical carrier, and a plurality of nodes connected along the first optical carrier and the second optical carrier and configured to communicate in pairs to define bidirectional links, the method comprising:

exchanging optical signals between one of the pairs of nodes over one of the bidirectional links by using a first wavelength on the first optical carrier and a second wavelength on the second optical carrier during normal operation;

detecting a failed link among the bidirectional links; and

reconfiguring the nodes in the one pair to invoke a protection scheme that uses the first wavelength on the second optical carrier and the second wavelength on the first optical carrier to avoid the failed link.

7. The method of claim 6, further comprising:

using a predetermined subset of wavelengths within a set of transmission wavelengths carried by the first optical carrier and the second optical carrier, wherein the step of exchanging includes optically separating, at each node of the plurality of nodes, each wavelength of the subset of wavelengths from the set of transmission wavelengths.

8. The method according to claim 6, wherein the step of detecting comprises:

verifying, in each of the plurality of nodes and for each wavelength in the set of wavelengths, whether the optical signals are received.

9. The method according to claim 6, wherein the step of detecting comprises:

verifying, in each of the plurality of nodes and for each wavelength in the set of wavelengths, whether the optical signals are degraded.

10. The method according to claim 6, wherein the step of detecting comprises:

verifying, in each of the plurality of nodes and for each wavelength in the set of wavelengths, whether the optical signals include a failure message.

11. The method of claim 6, further comprising:

transmitting a failure message between the nodes in the one pair based upon at least one of non-receipt of the optical signals and receipt of the optical signals that are degraded.

12. The method according to claim 6, wherein the step of reconfiguring comprises:

switching optical connections which selectively couple an optical transmitter and an optical receiver to the first optical carrier and the second optical carrier.

13. A reconfigurable node of an autoprotected optical communication ring network having a first optical carrier and a second optical carrier, comprising:

an optical transmitter configured to generate optical signals;

an optical receiver configured to receive optical signals; and

a plurality of transmitting transponders optically coupled to the first optical carrier and the second optical carrier;

a plurality of receiving transponders optically coupled to the first optical carrier and the second optical carrier; and

a plurality of optical switches coupled to the transmitting transponders and the receiving transponders, one of the optical switches being coupled to the optical transmitter , another one of the optical switches being coupled to the optical receiver,

wherein the optical switches are configured to operate selectively under a normal operating condition and under a failure condition the transponders using a first wavelength on the first optical carrier and a second wavelength that is different from the first wavelength on the second optical carrier during the normal condition, the transponders using the first wavelength on the second optical carrier and the second wavelength on the first optical carrier during the failure condition.

14. The node according to claim 13, wherein the plurality of transmitting transponders include a first transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at the first wavelength, a second transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at a second wavelength, and a third transmitting transponder optically coupled to a second optical carrier and configured to modulate a signal at the first wavelength, the plurality of receiving transponders including a first receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the first wavelength, a second receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the second wavelength, a third receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the second wavelength,

wherein, under the normal condition, the optical switches are configured to connect the optical transmitter to the first transmitting transponder and to the third transmitting transponder, to connect the first receiving transponder to the third transmitting transponder, to connect the second receiving transponder to the optical receiver, and to connect the third receiving transponder to the optical receiver and to the second transmitting transponder.

15. The node according to claim 14, further comprising:

another optical transmitter configured to generate an optical signal that includes information to be transmitted in the network; and

another optical receiver configured to receive an optical signal that includes information has been transmitted in the network,

wherein the plurality of transmitting transponders includes a fourth transmitting

transponder optically coupled to the second optical carrier and configured to modulate a signal at the second wavelength, the plurality of receiving transponders including a fourth receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the first wavelength, during normal condition, the optical switches being configured to connect the first receiving transponder to the third transmitting transponder and to the other receiver, to connect the fourth receiving transponder to the other receiver, and to connect the other optical transmitter to the second transmitting transponder and to the fourth transmitting transponder.

16. The node according to claim 14, wherein the first wavelength and the second wavelength are selected from a set of transmission wavelengths, the node further comprising:

a plurality of optical add/drop multiplexers configured to optically couple the transmitting transponders and the receiving transponders to the first optical carrier and the second optical carrier to feed and extract a subset of wavelengths from the optical carriers, and to bypass a remaining wavelengths of the set of transmission wavelengths.

17. The node according to claim 14, wherein the optical switches include 2x2 switches.

18. The node according to claim 14, wherein the optical switches include 1x2 and 2x1 switches.

19. The node according to claim 17, wherein the optical switches include discrete switching components.

20. The node according to claim 17, wherein the optical switches include an integrated switching matrix.

21. The node according to claim 19, wherein the optical switches include at least one of opto-mechanical switches, thermo-optical switches, magneto-optical switches, liquid crystal switches, semiconductor switches, electro-optical switches, micro-mechanical switches, and lithium niobate integrated circuit switches.